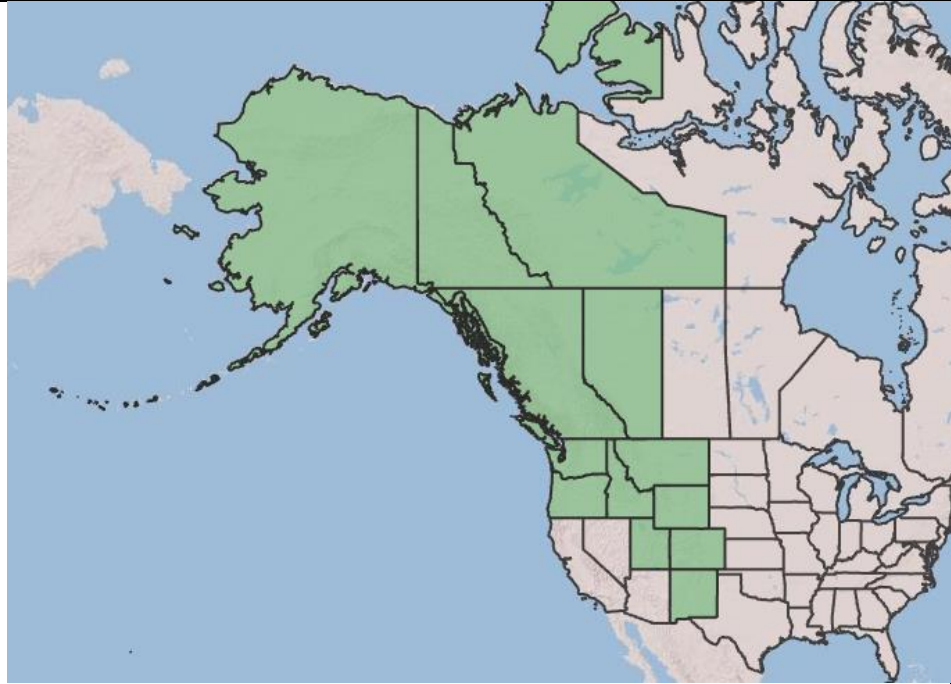
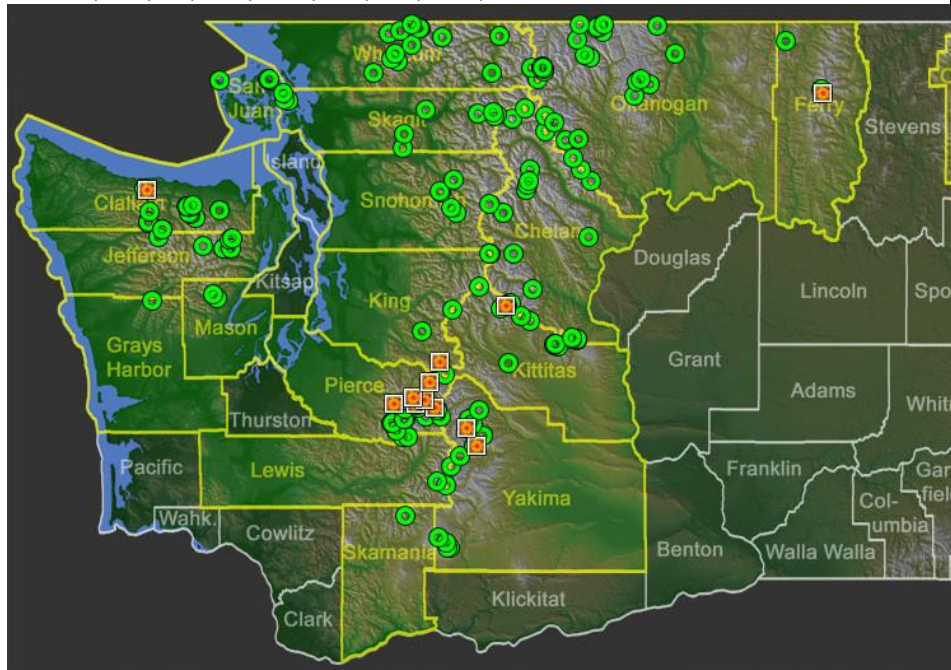


**Plant Propagation Protocol for *Saxifraga brachialis***

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2025/SABR6.pdf>

<b>TAXONOMY</b>	
<b>Plant Family</b>	
Scientific Name	Saxifragaceae
Common Name	Saxifrage Family
<b>Species Scientific Name</b>	
Scientific Name	<i>Saxifraga bronchialis</i> Linnaeus <sup>8</sup>
Varieties	-
Sub-species	<ul style="list-style-type: none"> <li>- <i>Saxifraga bronchialis</i> L. ssp. <i>austromontana</i> (Wiegand). Piper<sup>9</sup></li> <li>- <i>Saxifraga bronchialis</i> L. ssp. <i>cherlerioides</i> (D. Don). Hultén<sup>9</sup></li> <li>- <i>Saxifraga bronchialis</i> L. ssp. <i>codyanus</i> (Zhmylev) Cody<sup>9</sup></li> <li>- <i>Saxifraga bronchialis</i> L. ssp. <i>funstonii</i> (Small) Hultén<sup>9</sup></li> <li>- <i>Saxifraga bronchialis</i> L. ssp. <i>vespertina</i> (Small) Piper<sup>9</sup></li> </ul>
Cultivar	-
Common Synonym(s)	<i>Ciliaria bronchialis</i> (L.) Haw <sup>5</sup> <i>Leptasea bronchialis</i> (L.) Komarov <sup>5</sup>
Common Name(s)	Yellowdot saxifrage <sup>9</sup> : - <i>Saxifraga bronchialis</i> -ssp. <i>cherlerioides</i> -ssp. <i>codyanus</i> -ssp. <i>vespertina</i>  ssp. <i>austromontana</i> : Matted saxifrage <sup>9</sup> ssp. <i>funstonii</i> : Funston’s saxifrage <sup>9</sup>
Species Code (as per USDA Plants database)	SABR6 <sup>9</sup>
<b>GENERAL INFORMATION</b>	

<p>Geographical range</p>	 <p>US: AK, CO, ID, MT, NM, OR, UT, WA, WY <sup>9</sup></p>  <p>4</p>
<p>Ecological distribution</p>	<p>Alpine, Arctic, and subalpine<sup>7</sup> Rock crevices, open talus slopes, and gravelly tundra.<sup>9</sup></p>
<p>Climate and elevation range</p>	<p>Climate: Alpine, Arctic, and Subalpine Elevation: Higher elevation<sup>7</sup></p>
<p>Local habitat and abundance</p>	<p>Cliff crevices, talus and scree slopes, mid to high elevations in the mountains.<sup>10</sup></p>

	Rock crevices, open talus slopes, gravelly tundra. <sup>8</sup>
Plant strategy type / successional stage	No primary source of information, but it is likely a pioneer species due to its growth habit on gravelly slopes and rocks.
Plant characteristics	<p><i>Saxifraga bronchialis</i> is a perennial mat-forming herb. (wildflower) It has unlobed, leathery, basal, and cauline leaves that are linear or linear-lanceolate to narrowly elliptic. Its margin is entire, stiff, and often hooked. Additionally, it is white-ciliate and sometimes glandular ciliate. The leaf's surface is glabrous, though sometimes the adaxial side is sparsely sessile-glandular. It usually forms 2-15 flowered cymes. Its flowers have purplish sepals, yellowish white petals, with purple or red to yellow spots.<sup>1</sup></p> <p style="text-align: center;">SAXIFRAGA ° CRASSULA 3</p>
<b>PROPAGATION DETAILS: FROM SEED</b>	
<b>Adapted from USDI NPS Glacier National Park written by Tara Luna<sup>6</sup></b>	
Ecotype	Open rocky slope, Sun Point, Glacier National Park, Glacier Co., MT., 4600' elevation
Propagation Goal	Plants
Propagation Method	Seeds

Product Type	Container
Stock Type	160mL conetainer
Time to Grow	2 years
Target Specifications	2cm tall, with multiple leaves, with minimal internodal spacing, forming a “tight cushion.” Roots should form a firm plug with the soil inside the conetainer.
Propagule Collection Instructions	In the fall, capsules will be brown and starting to split; collect them in paper bags. Seeds should be black at maturity. Keep seeds well ventilated prior to cleaning.
Propagule Processing/Propagule Characteristics	Seeds/kg: N/A Purity: 100% Germination Rate: N/A
Pre-Planting Propagule Treatments	These seeds can be hand cleaned by rubbing the capsules, releasing the seeds. Seeds are stated to have physiological dormancy, thus requiring stratification. Breaking this dormancy was achieved with a 5-month outdoor, cold, moist stratification. Germination occurred 4 months after the cold, moist stratification in warm temperatures. GA and exposure to light stimulate germination in some <i>Saxifraga</i> species, and should be considered. In a paper studying <i>Saxifraga italica</i> , another alpine saxifrage, they found that germination percentage was highest at 20 °C with exposure to light and that decreasing PPF led to a decrease in germination. Additionally, with a 500 ppm gibberellin solution, seeds germinated in the dark, but only at a rate of about 50%. <sup>5</sup>
Growing Area Preparation / Annual Practices for Perennial Crops	The growing area used in this protocol was an outdoor growing facility. The medium used in the 160mL conetainers consisted of a ratio of 6:1:1 milled sphagnum peat, perlite, and vermiculite. Osmocote (NPK: 13N 13P2O5 13K2O), as well as Micromax fertilizer (12% Sulfur, 0.1% Boron, 0.5% Copper, 12% Iron, 2.5% Manganese, 0.05% Molybdenum, and 1% Zinc) was added at a rate of 1g Osmocote and 0.2g Micromax per conetainer. After adding the medium and fertilizer, seeds are surface sown in late fall and irrigated thoroughly prior to winter stratification. A Rainbird automatic irrigation system was used to water the seedlings in the early morning, until the containers were thoroughly leached. At the outdoor growing facility, the growing season occurs on average from late April to October 15th.
Establishment Phase Details	The medium is kept slightly moist during germination. Initial germination occurs in late summer.

Length of Establishment Phase	4 weeks
Active Growth Phase	After germination, roots and shoots grow rapidly. In late September 4-6 true leaves were found on average, but the roots were not tight in the conetainer. It is important not to overwater after initial establishment.
Length of Active Growth Phase	First year: 8 weeks Second year: 10 weeks
Hardening Phase	In the fall irrigation is gradually reduced, and one final irrigation is applied before winterization.
Length of Hardening Phase	4 weeks
Harvesting, Storage and Shipping	2 years until harvest
Length of Storage	5 months
Guidelines for Outplanting / Performance on Typical Sites	
Other Comments	To overwinter these plants leave them in an outdoor nursery under insulating foam and snow.
<b>INFORMATION SOURCES</b>	
References	<ol style="list-style-type: none"> <li>1. Brouillet, L., &amp; Elvander, P. (2020, July 30). <i>Saxifraga bronchialis</i>. FNA. <a href="http://floranorthamerica.org/Saxifraga_bronchialis">http://floranorthamerica.org/Saxifraga_bronchialis</a></li> <li>2. Di Cecco, V., Di Musciano, M., Frattaroli, A. R., &amp; Di Martino, L. (2019). Seed ecology of <i>Saxifraga italica</i>: Effects of light, temperature and gibberellic acid. <i>Folia Geobotanica</i>, 54(1–2), 139–150. <a href="https://doi.org/10.1007/s12224-019-09352-5">https://doi.org/10.1007/s12224-019-09352-5</a></li> <li>3. <i>File:FNA8 P18 Saxifraga ronchialis.jpeg</i>. (2020, August 26). FNA. <a href="http://dev.floranorthamerica.org/File:FNA8_P18_Saxifraga_ronchialis.jpeg">http://dev.floranorthamerica.org/File:FNA8_P18_Saxifraga_ronchialis.jpeg</a></li> <li>4. Giblin, D. (n.d.). <i>Saxifraga austromontana</i>. Burke Herbarium Image Collection. Retrieved May 14, 2025, from <a href="https://burkeherbarium.org/imagecollection/taxon.php?Taxon=Saxifraga%20austromontana">https://burkeherbarium.org/imagecollection/taxon.php?Taxon=Saxifraga%20austromontana</a></li> </ol>

	<ol style="list-style-type: none"> <li>5. International Plant Names Index. (n.d.). <i>Saxifraga bronchialis</i>. International Plant Names Index. Retrieved May 14, 2025, from <a href="https://www.ipni.org/n/30119902-2">https://www.ipni.org/n/30119902-2</a></li> <li>6. Luna, T., Evans, J., &amp; Wick, D. (2008). <i>Propagation protocol for production of Container (plug) Saxifraga bronchialis L. plants 160 ml conetainers</i>. Native Plant Network Propagation Protocol Database; USDI NPS-Glacier National Park. <a href="https://nnp.rngr.net/renderNPNProtocolDetails?selecte dProtocolIds=saxifragaceae-saxifraga-210&amp;referer=wildflower">https://nnp.rngr.net/renderNPNProtocolDetails?selecte dProtocolIds=saxifragaceae-saxifraga-210&amp;referer=wildflower</a></li> <li>7. Turner, M. (n.d.). <i>Saxifraga bronchialis</i>. Wildflowers of the Pacific Northwest. Retrieved May 14, 2025, from <a href="https://www.pnwflowers.com/flower/saxifraga-bronchialis">https://www.pnwflowers.com/flower/saxifraga-bronchialis</a></li> <li>8. TWC Staff. (2023, February 24). <i>Lady Bird Johnson wildflower center</i>. The University of Texas at Austin; Lady Bird Johnson Wildflower Center. <a href="https://www.wildflower.org/plants/result.php?id_plant=sabr6">https://www.wildflower.org/plants/result.php?id_plant=sabr6</a></li> <li>9. <i>USDA Plants Database- Saxifraga bronchialis</i>. (n.d.). USDA Natural Resources Conservation Service; USDA. Retrieved May 14, 2025, from <a href="https://plants.usda.gov/plant-profile/SABR6">https://plants.usda.gov/plant-profile/SABR6</a></li> <li>10. Washington Native Plant Society. (n.d.). <i>Saxifraga austromontana</i>. Washington Native Plant Society- Native Plant Directory; WNPS. Retrieved May 14, 2025, from <a href="https://www.wnps.org/native-plant-directory/2261:saxifraga-austromontana">https://www.wnps.org/native-plant-directory/2261:saxifraga-austromontana</a></li> </ol>
Other Sources Consulted	<ol style="list-style-type: none"> <li>1. Oregon Flora. (n.d.). <i>OregonFlora- Saxifraga vespertina</i>. OregonFlora. Retrieved May 14, 2025, from <a href="https://oregonflora.org/taxa/index.php?taxon=8195&amp;synonym=8159">https://oregonflora.org/taxa/index.php?taxon=8195&amp;synonym=8159</a></li> <li>2. SEINet. (n.d.). <i>SEINet Portal Network. Saxifraga Bronchialis</i>; SEINet. Retrieved May 14, 2025, from</li> </ol>

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Protocol Author	Joseph Gessell
Date Protocol Created or Updated	05/13/25